DAQ Monitor Tutorial

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Introduction

- Purposes
  - Performance monitoring during a run.
  - Performance tuning tool during commissioning.
  - Diagnostic tool in case of problems.
- Program
  - Server (DM_Server) and Client (DAQ_Monitor.py) system.
  - Communicates with DAQ system elements using itc.
  - Client displays information using Python/Tkinter GUI modules.

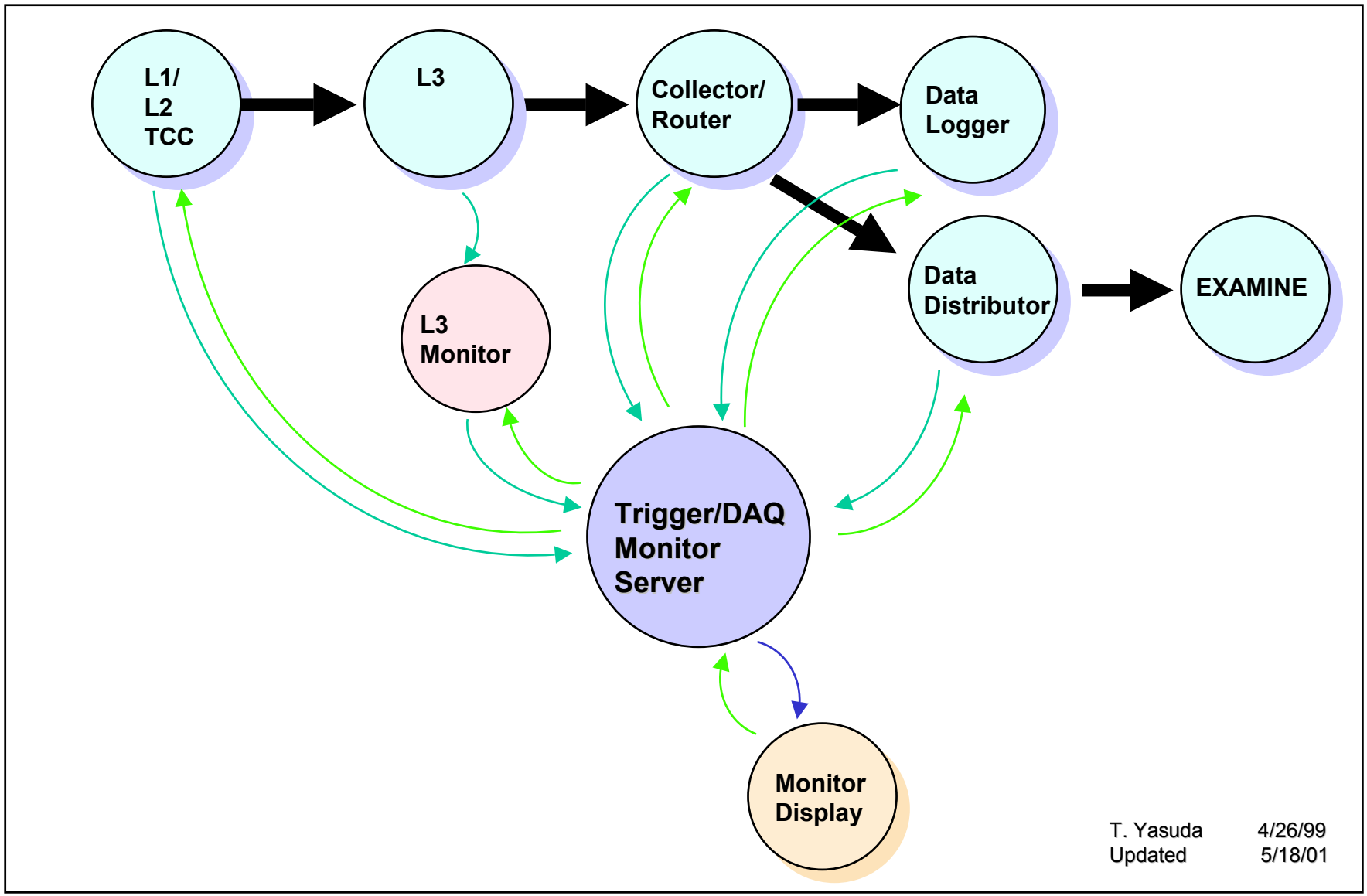
How it works

- DM_Server is:
  - an itc server with an itc processor to handle messages.
  - Contains a DM_Task class object.
  - DM_Task class object contains client objects for DAQ processes, e.g. TCC, Distributor, etc.
    - The clients objects are private data members of DM_Task class.
    - Data received from the DAQ processes as an itc message are handled by a callback method of the client object that requested the data.

How it works

- Requests data to the DAQ processes by sending an itc message.
- Communicates with receiver clients (Display clients).
- Receiver clients send a string message to request data from the DM_Server.

Trigger/DAQ Monitor



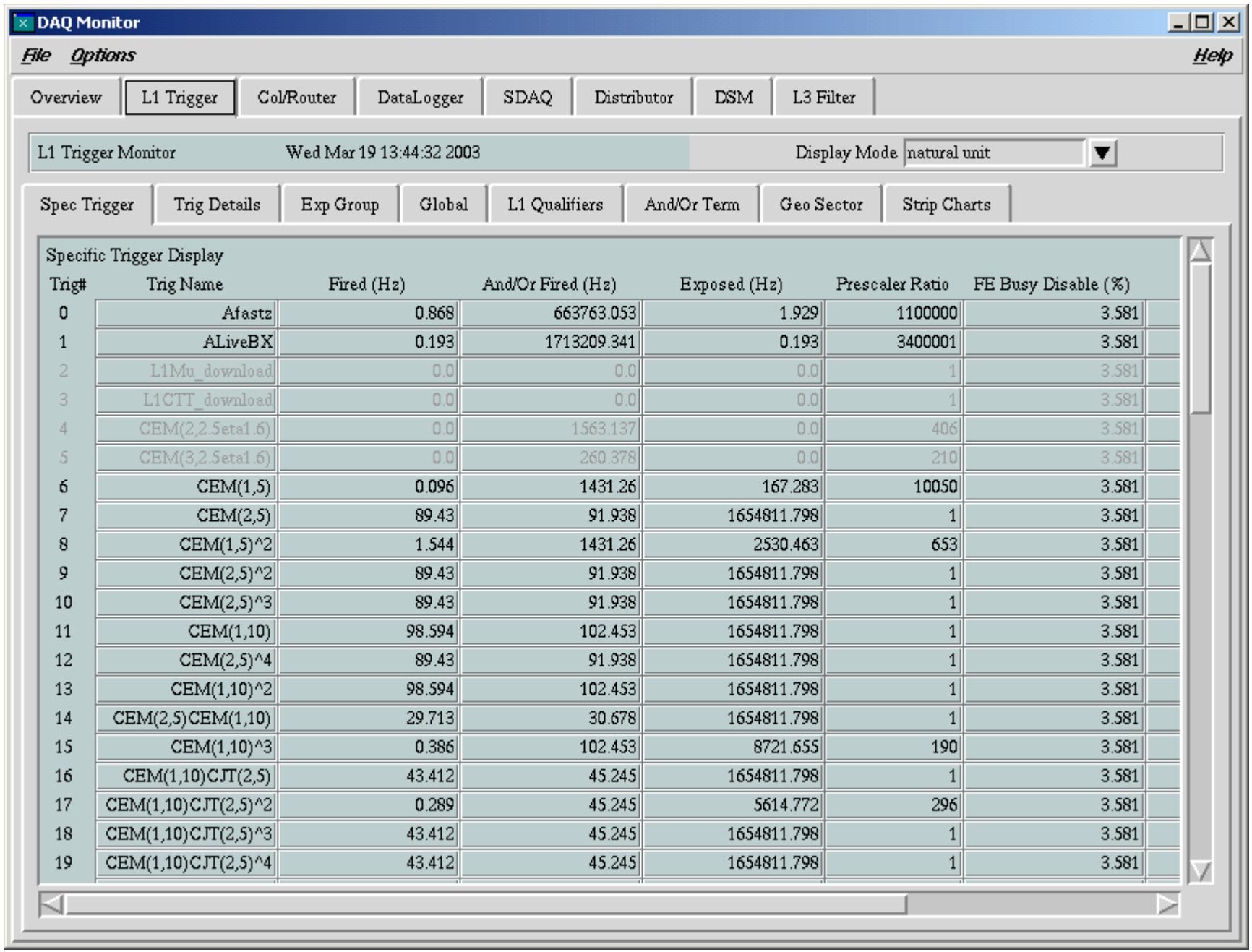
Software

- A cvs package: daq_monitor
- Written in C++ (server) and python (display client).
- Uses itc for communication.
- Different message types for individual sub-processes that run C++ server/client.
- String and opaque messages only for python (display) clients.
- Messages are encoded/decoded in XDR.
- Compiles on Linux.

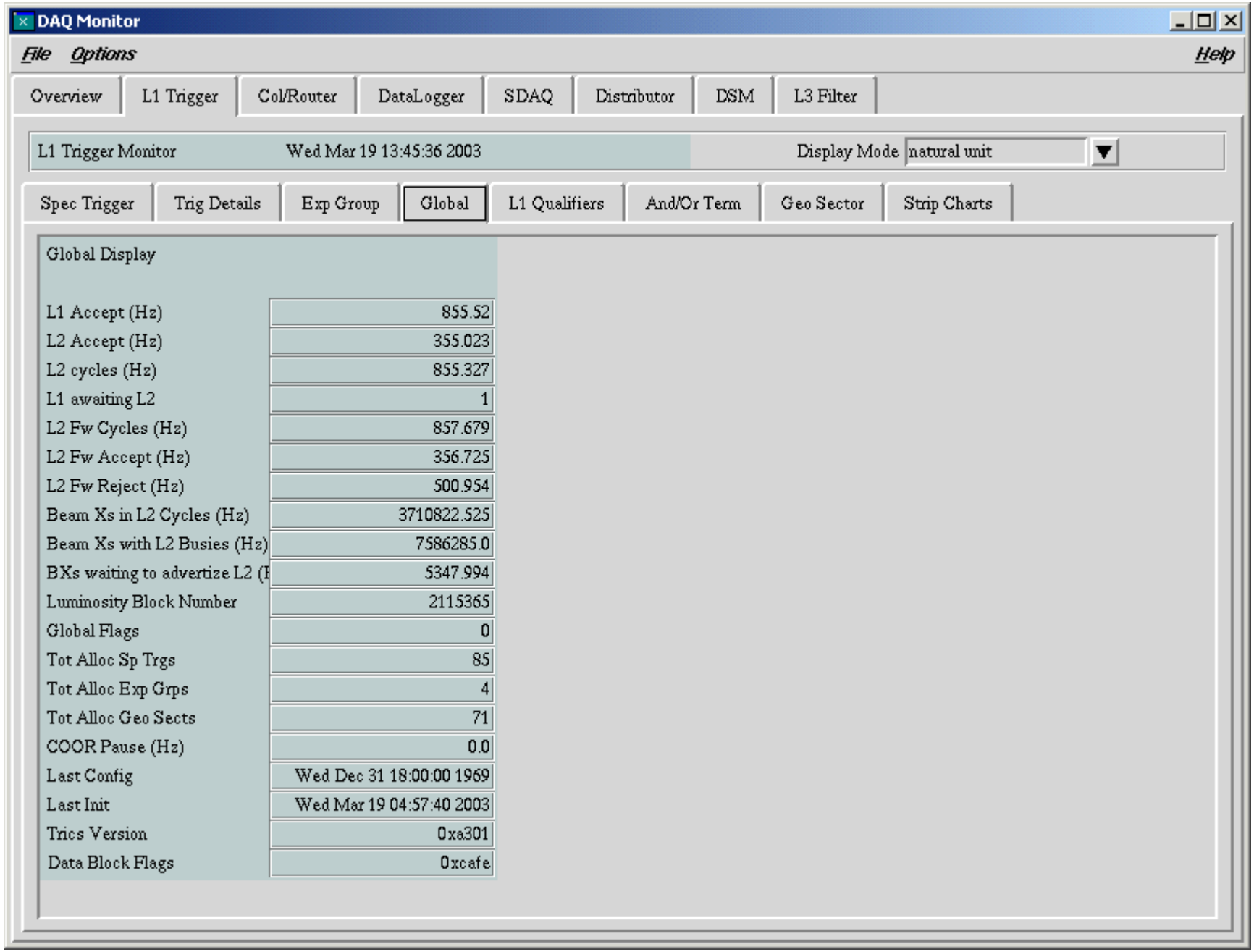
Instructions

- To start the DAQ Monitor server
  - `setup d0online`
  - `start_daq_monitor_server`
  - `or start_daq daq_monitor_server`
- To start a DAQ monitor display client (from any online node)
  - `setup d0online`
  - `start_daq_monitor_display`
  - `or start_daq daq_monitor`
    `start_daq daq_monitor_small`


DAQ Monitor
File
Options
Help
Overview
L1 Trigger
Col/Router
DataLogger
SDAQ
Distributor
DSM
L3 Filter
DAQ Process Overview
Wed Mar 19 13:42:31 2003
L1 Trigger Status
Connection:
Up
L2 Trigger Status
Connection:
Up
L3 Filter Status
Connection:
Up
Col/Router Status
Connection:
Up
DataLogger Status
Connection:
Up
SDAQ Status
Connection:
Up
Distributor Status
Connection:
Up
DSM Status
Connection:
Up



Trig#	Trig Name	Fired (Hz)	And/Or Fired (Hz)	Exposed (Hz)	Prescaler Ratio	FE Busy Disable (%)
0	Afastz	0.868	663763.053	1.929	1100000	3.581
1	ALiveBX	0.193	1713209.341	0.193	3400001	3.581
2	L1Mu_download	0.0	0.0	0.0	1	3.581
3	L1CTT_download	0.0	0.0	0.0	1	3.581
4	CEM(2,2.5eta1.6)	0.0	1563.137	0.0	406	3.581
5	CEM(3,2.5eta1.6)	0.0	260.378	0.0	210	3.581
6	CEM(1,5)	0.096	1431.26	167.283	10050	3.581
7	CEM(2,5)	89.43	91.938	1654811.798	1	3.581
8	CEM(1,5)^2	1.544	1431.26	2530.463	653	3.581
9	CEM(2,5)^2	89.43	91.938	1654811.798	1	3.581
10	CEM(2,5)^3	89.43	91.938	1654811.798	1	3.581
11	CEM(1,10)	98.594	102.453	1654811.798	1	3.581
12	CEM(2,5)^4	89.43	91.938	1654811.798	1	3.581
13	CEM(1,10)^2	98.594	102.453	1654811.798	1	3.581
14	CEM(2,5)CEM(1,10)	29.713	30.678	1654811.798	1	3.581
15	CEM(1,10)^3	0.386	102.453	8721.655	190	3.581
16	CEM(1,10)CJT(2,5)	43.412	45.245	1654811.798	1	3.581
17	CEM(1,10)CJT(2,5)^2	0.289	45.245	5614.772	296	3.581
18	CEM(1,10)CJT(2,5)^3	43.412	45.245	1654811.798	1	3.581
19	CEM(1,10)CJT(2,5)^4	43.412	45.245	1654811.798	1	3.581


DAQ Monitor
File
Options
Help
Overview
L1 Trigger
Col/Router
DataLogger
SDAQ
Distributor
DSM
L3 Filter
L1 Trigger Monitor
Wed Mar 19 13:45:36 2003
Display Mode
natural unit
Spec Trigger
Trig Details
Exp Group
Global
L1 Qualifiers
And/Or Term
Geo Sector
Strip Charts
Global Display
L1 Accept (Hz) 855.52
L2 Accept (Hz) 355.023
L2 cycles (Hz) 855.327
L1 awaiting L2 1
L2 Fw Cycles (Hz) 857.679
L2 Fw Accept (Hz) 356.725
L2 Fw Reject (Hz) 500.954
Beam Xs in L2 Cycles (Hz) 3710822.525
Beam Xs with L2 Busies (Hz) 7586285.0
BXs waiting to advertize L2 (I 5347.994
Luminosity Block Number 2115365
Global Flags 0
Tot Alloc Sp Trgs 85
Tot Alloc Exp Grps 4
Tot Alloc Geo Sects 71
COOR Pause (Hz) 0.0
Last Config Wed Dec 31 18:00:00 1969
Last Init Wed Mar 19 04:57:40 2003
Trics Version 0xa301
Data Block Flags 0xcafe

DAQ Monitor

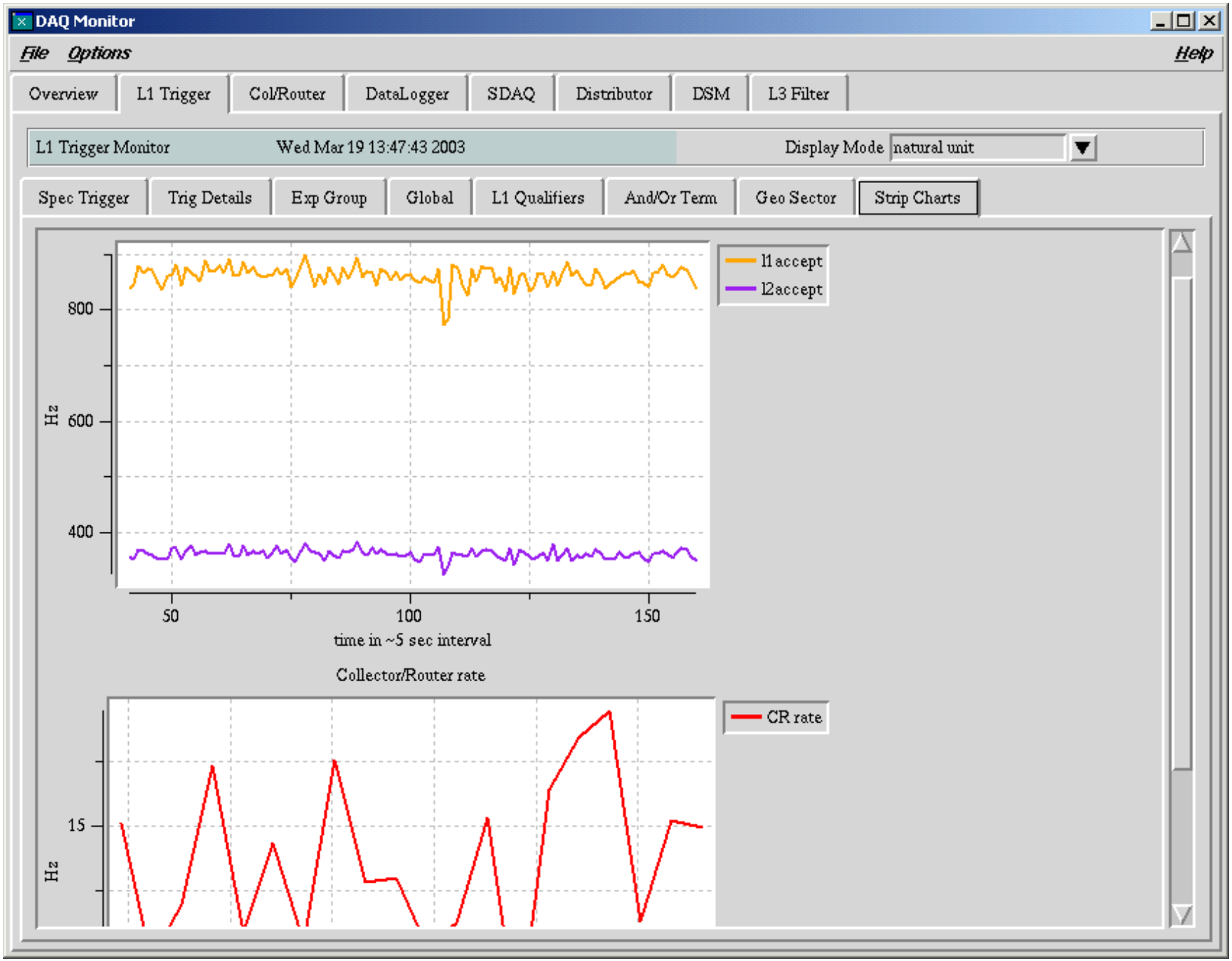
File Options Help

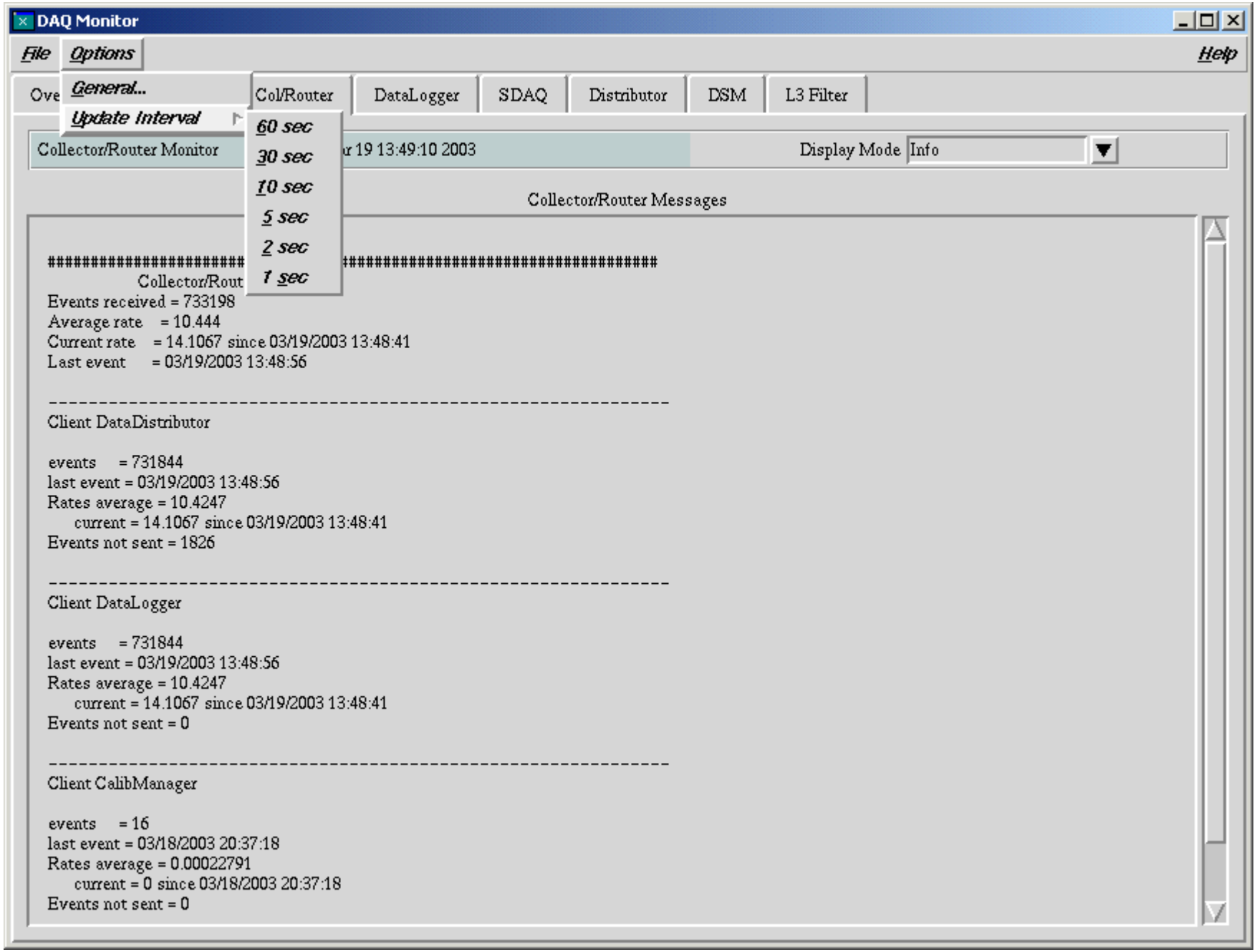
Overview | L1 Trigger | Col/Router | DataLogger | SDAQ | Distributor | DSM | L3 Filter

L1 Trigger Monitor Wed Mar 19 13:46:29 2003 Display Mode: natural unit

Spec Trigger | Trig Details | Exp Group | Global | L1 Qualifiers | And/Or Term | Geo Sector | Strip Charts

A/O #	FIFO	Syn Err	Fired (Hz)	A/O #	FIFO	Syn Err	Fired (Hz)	A/O #	FIFO	Syn Err	Fired (Hz)	A/O #	FIFO	Syn Err
0	21	0	811114.855	50	1	0	26881.695	100	255	0	0.0	150	9	0
1	21	0	0.0	51	1	0	9273.713	101	255	0	0.0	151	9	0
2	21	0	0.0	52	1	0	4227.299	102	255	0	0.0	152	10	0
3	21	0	0.0	53	1	0	59948.763	103	255	0	0.0	153	10	0
4	21	0	0.0	54	1	0	6223.808	104	255	0	0.0	154	10	0
5	21	0	0.0	55	1	0	2670.961	105	255	0	0.0	155	10	0
6	21	0	0.0	56	1	0	1496.271	106	255	0	0.0	156	10	0
7	21	0	0.0	57	1	0	9881.531	107	255	0	0.0	157	10	0
8	21	0	0.0	58	1	0	1.931	108	255	0	0.0	158	10	0
9	21	0	0.0	59	1	0	0.0	109	255	0	0.0	159	10	0
10	21	0	0.0	60	1	0	47712.639	110	255	0	0.0	160	255	0
11	21	0	0.0	61	1	0	0.0	111	255	0	0.0	161	255	0
12	21	0	0.0	62	1	0	0.0	112	255	0	0.0	162	255	0
13	21	0	0.0	63	1	0	0.0	113	255	0	0.0	163	255	0
14	21	0	0.0	64	255	0	0.0	114	255	0	0.0	164	255	0
15	21	0	0.0	65	255	0	0.0	115	255	0	0.0	165	255	0
16	21	0	0.193	66	255	0	0.0	116	255	0	0.0	166	255	0
17	21	0	3.09	67	255	0	0.0	117	255	0	0.0	167	255	0
18	21	0	11.589	68	255	0	0.0	118	255	0	0.0	168	255	0
19	21	0	11.589	69	255	0	0.0	119	255	0	0.0	169	255	0

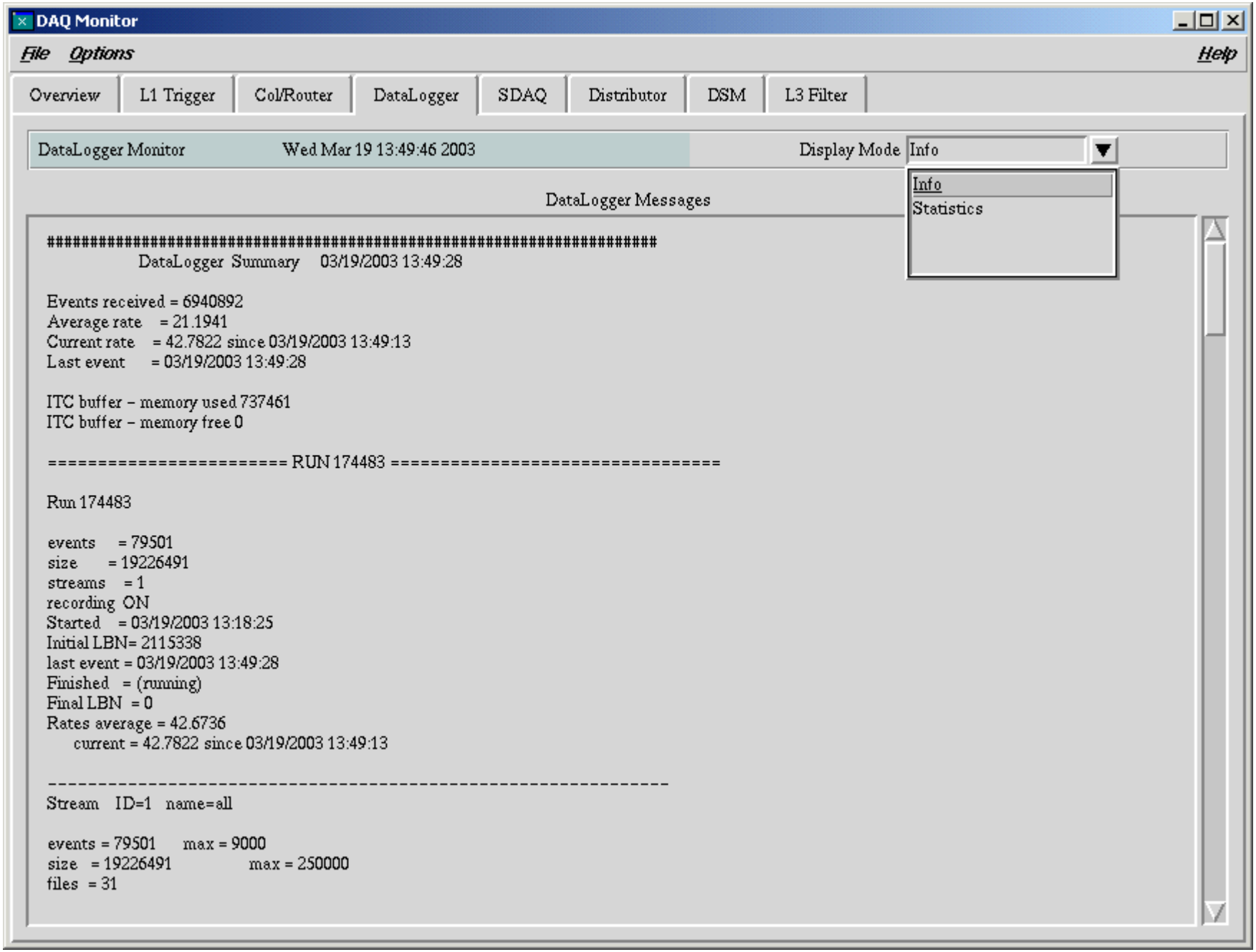

DAQ Monitor
File
Options
Help
Overview
L1 Trigger
Col/Router
DataLogger
SDAQ
Distributor
DSM
L3 Filter
L1 Trigger Monitor
Wed Mar 19 13:47:43 2003
Display Mode
natural unit
Spec Trigger
Trig Details
Exp Group
Global
L1 Qualifiers
And/Or Term
Geo Sector
Strip Charts
l1accept
l2accept
800
600
400
Hz
50
100
150
time in ~5 sec interval
Collector/Router rate
CR rate
15
Hz


DAQ Monitor
File
Options
Help
General...
Update Interval
60 sec
30 sec
10 sec
5 sec
2 sec
1 sec
Ove
Col/Router
DataLogger
SDAQ
Distributor
DSM
L3 Filter
Collector/Router Monitor
r 19 13:49:10 2003
Display Mode
Info
Collector/Router Messages
##########
##########
Collector/Rout
Events received = 733198
Average rate = 10.444
Current rate = 14.1067 since 03/19/2003 13:48:41
Last event = 03/19/2003 13:48:56

Client DataDistributor
events = 731844
last event = 03/19/2003 13:48:56
Rates average = 10.4247
current = 14.1067 since 03/19/2003 13:48:41
Events not sent = 1826

Client DataLogger
events = 731844
last event = 03/19/2003 13:48:56
Rates average = 10.4247
current = 14.1067 since 03/19/2003 13:48:41
Events not sent = 0

Client CalibManager
events = 16
last event = 03/18/2003 20:37:18
Rates average = 0.00022791
current = 0 since 03/18/2003 20:37:18
Events not sent = 0


DAQ Monitor
File
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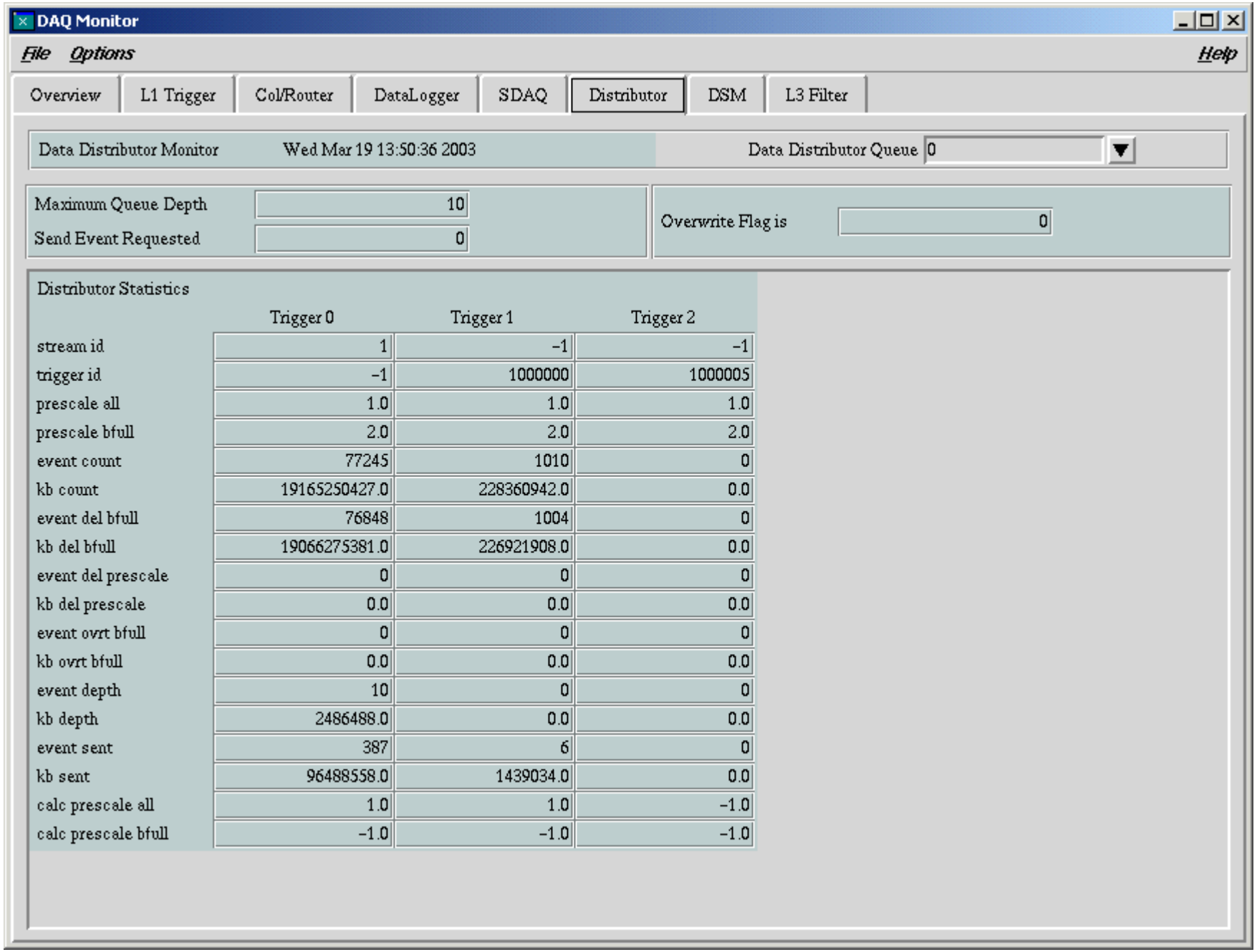
L3 Filter
DataLogger Monitor
Wed Mar 19 13:49:46 2003
Display Mode
Info
Info
Statistics
DataLogger Messages
##
DataLogger Summary 03/19/2003 13:49:28
Events received = 6940892
Average rate = 21.1941
Current rate = 42.7822 since 03/19/2003 13:49:13
Last event = 03/19/2003 13:49:28
ITC buffer - memory used 737461
ITC buffer - memory free 0
========== RUN 174483 ==========
Run 174483
events = 79501
size = 19226491
streams = 1
recording ON
Started = 03/19/2003 13:18:25
Initial LBN= 2115338
last event = 03/19/2003 13:49:28
Finished = (running)
Final LBN = 0
Rates average = 42.6736
current = 42.7822 since 03/19/2003 13:49:13
Stream ID=1 name=all
events = 79501 max = 9000
size = 19226491 max = 250000
files = 31


DAQ Monitor
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L1 Trigger
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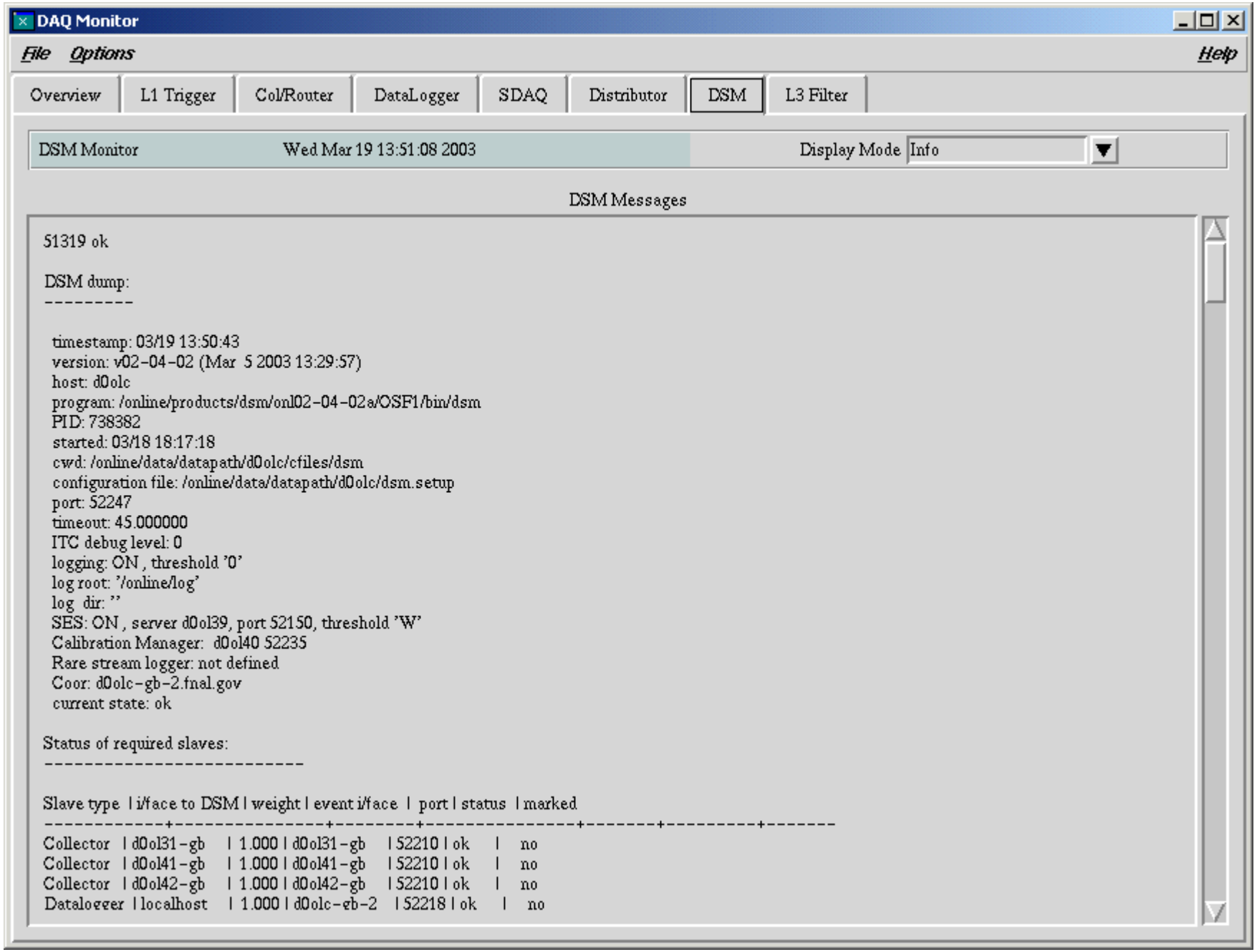
L3 Filter
Data Distributor Monitor
Wed Mar 19 13:50:36 2003
Data Distributor Queue
0
Maximum Queue Depth
10
Send Event Requested
0
Overwrite Flag is
0
Distributor Statistics
Trigger 0
Trigger 1
Trigger 2
stream id 1 -1 -1
trigger id -1 1000000 1000005
prescale all 1.0 1.0 1.0
prescale bfull 2.0 2.0 2.0
event count 77245 1010 0
kb count 19165250427.0 228360942.0 0.0
event del bfull 76848 1004 0
kb del bfull 19066275381.0 226921908.0 0.0
event del prescale 0 0 0
kb del prescale 0.0 0.0 0.0
event ovrt bfull 0 0 0
kb ovrt bfull 0.0 0.0 0.0
event depth 10 0 0
kb depth 2486488.0 0.0 0.0
event sent 387 6 0
kb sent 96488558.0 1439034.0 0.0
calc prescale all 1.0 1.0 -1.0
calc prescale bfull -1.0 -1.0 -1.0


DAQ Monitor
File
Options
Help
Overview
L1 Trigger
Col/Router
DataLogger
SDAQ
Distributor
DSM
L3 Filter
DSM Monitor
Wed Mar 19 13:51:08 2003
Display Mode
Info
DSM Messages
51319 ok
DSM dump:
timestamp: 03/19 13:50:43
version: v02-04-02 (Mar 5 2003 13:29:57)
host: d0olc
program: /online/products/dsm/onl02-04-02a/OSF1/bin/dsm
PID: 738382
started: 03/18 18:17:18
cwd: /online/data/datapath/d0olc/cfiles/dsm
configuration file: /online/data/datapath/d0olc/dsm.setup
port: 52247
timeout: 45.000000
ITC debug level: 0
logging: ON , threshold '0'
log root: '/online/log'
log dir: ''
SES: ON , server d0ol39, port 52150, threshold 'W'
Calibration Manager: d0ol40 52235
Rare stream logger: not defined
Coor: d0olc-gb-2.fnal.gov
current state: ok
Status of required slaves:
Slave type | i/face to DSM | weight | event i/face | port | status | marked
Collector | d0ol31-gb | 1.000 | d0ol31-gb | 52210 | ok | no
Collector | d0ol41-gb | 1.000 | d0ol41-gb | 52210 | ok | no
Collector | d0ol42-gb | 1.000 | d0ol42-gb | 52210 | ok | no
Datalogger | localhost | 1.000 | d0olc-gb-2 | 52218 | ok | no

DAQ Monitor

File Options Help

Overview | L1 Trigger | Col/Router | DataLogger | SDAQ | Distributor | DSM | L3 Filter

L3 Filter last updated Wed Mar 19 13:51:18 2003

Display Mode: Raw count ▼ Integration Mode: Integral ▼

Run	L2 bit	L2 Name	L1 bit	L3 bit	L3 Script Name	# called	# passed	# forced	# prescaled	L3 Filt
174483	0	1^min_bias	0	0	min_bias	1067	1067	0	0	
	1	2^zero_bias	1	1	zero_bias	945	945	0	0	
	2	)^L1MU_DOWNLOAD	2							
	3	^L1CTT_DOWNLOAD	3							
	4	5^2EM_JPSI	4	4	2EM_JPSI	0	0	0	0	
				5	2EM_JPSI_TRK	0	0	0	0	
	5	7^3EM_MN	5	6	3EM_MN	0	0	0	0	
				7	3EM_MN_TRK	0	0	0	0	
	6	9^CEM5	6	8	CEM5	249	249	0	0	
	7	10^2EM_2MD7	7	9	2EM_2MD7	105046	9301	0	0	
	8	11^EM_LO	8	10	EM_LO	4026	310	30	0	
				11	EM_LO_SH	4026	378	21	0	
	9	13^2EM_2MD12	9	12	2EM_2MD12	105046	1536	0	0	